REMARKS

By this amendment, claims 1, 4-5, and 13 have been amended. Claims 6-12 have been cancelled. Claims 1-5 and 13 remain in the application. This application has been carefully considered in connection with the Examiner's Action. Reconsideration, withdrawal of the final action, and allowance of the application, as amended, is respectfully requested.

Rejection under 35 U.S.C. § 102

Claims 6 and 8-13 were rejected under 35 U.S.C. § 102(e) as being anticipated by Lobregt et al (USPN 6,078,699). With respect to claims 6 and 8-12, the same have been cancelled by this amendment, thus rendering the rejection thereof moot.

With respect to claim 13, applicants respectfully traverse this rejection for at least the following reasons. As amended and now more clearly presented, claim 13 is directed to a computer program product comprising computer readable media having a set of instructions executable by a computer, the instructions being configured for merging a pair of overlapping two dimensional (2D) images that comprise projections of a single three-dimensional (3D) scene according to the method of claim 1. As is discussed herein below, claim 1 is believed prima facie allowable over the art of record. Accordingly, claim 13 which depends from allowable claim 1, in a patentable sense, is also believed allowable.

Rejection under 35 U.S.C. § 103

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lobregt as applied to claim 6, and further in view of Poulo et al. (USPN 6,535,650). With respect to claim 7, the same have been cancelled by this amendment, thus rendering the rejection thereof moot.

Claim 1

Claim 1 recites a method for merging a pair of overlapping two-dimensional (2D) images, wherein the images comprise projections of a single three-dimensional (3D) scene, said method comprising: selecting at least four feature points in the 3D scene within an overlapping region of the pair of 2D images, finding 2D coordinates of points in both images corresponding to the selected feature points, the 2D coordinates being found with respect to original coordinate systems in the two images, translating coordinates of the 2D coordinates found in the original coordinate systems of the two images by a chosen translation, wherein the translation is chosen to substantially minimize in a translated coordinate system, on average, numerical coordinate ranges of coordinate values of the 2D coordinates found, determining first projective transformation parameters of a substantially optimal projective transformation in the translated coordinate system relating corresponding translated coordinates of the 2D coordinates found in the two images, determining second projective transformation parameters of a projective transformation for application in the non-translated original coordinate systems of the two images, wherein determining the second projective transformation parameters comprises altering the first projective transformation parameters in the translated coordinate system using translation vectors that ensure an equivalence of (i) the projective transformation in the original coordinate systems and (ii) the projective transformation in the translated coordinate system is true, and merging the two images into a single composite 2D image by (i) transforming one 2D image according to the projective transformation for application in the non-translated original coordinate systems of the two images into a transformed 2D image using the second projective transformation parameters and (ii) combining the transformed 2D image with the other 2D image.

Claims 1-3 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schultz et al ("Multiframe integration via the projective transformation with

automated block matching feature point selection") in view of Jasinschi et al (USPN 6,504,569), and further in view of Nettles (USPN 5,430,806).

Applicants traverse this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness with respect to claim 1. The Schultz, Jasinschi, and Nettles references cannot be applied to reject claim 1 under 35 U.S.C. § 103 in that, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, since neither Schultz, Jasinschi nor Nettles teaches ... selecting at least four feature points in the 3D scene *within an overlapping region of the pair of 2D images* ... *translating coordinates* of the 2D coordinates found in the original coordinate systems ... *by a chosen translation*, ... to *substantially minimize* in *a translated coordinate system*, on average, *numerical coordinate ranges* of coordinate values of the 2D coordinates found, *determining first projective transformation parameters* of a substantially optimal projective transformation *in the translated coordinate system* ... , determining *second projective transformation parameters* of a projective transformation *for application in the non-translated original coordinate systems* ... , wherein determining the *second projective transformation parameters* comprises *altering* the *first projective transformation parameters in the translated coordinate systems* using *translation vectors* that *ensure* an *equivalence* of (i) the projective transformation *in the original coordinate systems* **and** (ii) the projective transformation *in the translated coordinate system* is true, and merging ... by (i) *transforming one 2D image* according to the *projective transformation for application in the non-translated original coordinate systems* of the two images into a transformed 2D image using the *second projective transformation parameters* and (ii) combining ..., as is claimed in claim 1, it is impossible to render the subject matter of claim 1 as a whole obvious.

In contrast, Schultz teaches an automated image registration algorithm based on projective transformation which accounts for camera translation, rotation, zoom, pan and tilt, wherein feature selection is performed by a block matching algorithm and wherein end-points of translation vectors serve as feature point pairs. Shultz further discloses calculating a least squares solution for the projective transformation using only the "best" feature point pairs (Shultz, page 3266, first column, last paragraph; and page 3267, second column, first paragraph).

Jasinschi, on the other hand, teaches extracting 3D data (as opposed to 2D data) from a video sequence. Jansinschi discloses generating a 2D ***extended image*** from *3-D* data extracted from the video sequence of a 3D scene, that is, from motion parameters and a depth map using a plane perspective projection technique (in contrast to merging a pair of overlapping 2D images into a composite image). In addition, Jansinchi discloses a "preprocessing stage" in which different sets of camera parameters are estimated.

With respect to the preprocessing stage, Jansinschi discloses the need for dividing an image into *identical* ***image blocks***, so that each block contains the ***same number*** of feature points to enforce that the feature points used in the estimation of the camera parameters *span the whole extension* of the input image I_k. (Jansinschi at Col 6, lines 42-55). Jansinschi also discloses calibration of feature point coordinates using a coordinate calibration transformation in the estimation of an essential (E) matrix. However, the calibration of feature point coordinates in the identical image blocks of Jansinschi is directed to a method in which identical non-overlapping image blocks contain the *same number* of feature points to enforce that the feature points used in the estimation of the camera parameters *span the whole extension* of the input image I_k.

Lastly, Nettles teaches a system for changing a perspective view of 3-D images obtained from reflected energy signals. To create a new image, each data element's row-column address is first converted into a *spherical coordinate*. The spherical coordinate is then *converted into* a *3-D Cartesian coordinate*, and the Cartesian coordinate is ***translated and rotated*** to achieve a *new perspective*. In Nettles, it is a third coordinate system that is subjected to a translation and rotation, *in contrast to translating coordinates* of the 2D coordinates found in the original coordinate systems ... *by a chosen translation*, ... to *substantially minimize* in a *translated coordinate system*, on average, *numerical coordinate ranges* of coordinate values of the 2D coordinates found.

Thus, a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. §103 should be withdrawn. Accordingly, claim 1 is allowable and an early formal notice thereof is requested.

With respect to claims 2, 3 and 5, the claims depend from and add further limitation, in a patentable sense, to allowable claim 1. Accordingly, claims 2-5 and 13 are believed allowable.

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Schultz, Jasinschi, and Nettles as applied to claim 1 above, and further in view of well known prior art. Applicant respectfully traverses this rejection for at least the following reasons. Claim 4 depends from and further limits, in a patentable sense, allowable independent claim 1 and therefore is allowable as well.

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Conclusion

It is clear from all of the foregoing that independent claim 1 is in condition for allowance. Dependent claims 2-5 and 13 depend from and further limit independent claim 1 and therefore are allowable as well.

The amendments herein are fully supported by the original specification and drawing, therefore, no new matter is introduced.

Withdrawal of the final action and issuance of an early formal notice of allowance of claims 1-5 and 13 is respectfully requested.

Respectfully submitted,

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